

### **REMARKS**

Claims 22-27, 30 and 33-42 are pending in this application. For purposes of expedition, claims 28-29 and 31-32 have been canceled without prejudice or disclaimer. Claims 22-27, 30 and 33-40 have been amended in several particulars for purposes of clarity and brevity that are unrelated to patentability and prior art rejections in accordance with current Office policy, to further and alternatively define Applicants' disclosed invention and to assist the Examiner to expedite compact prosecution of the instant application.

Claims 22-26 and 28-42 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Brass et al., U.S. Patent No. 6,177,678, as modified to incorporate selected features from Chappelle et al., U.S. Patent No. 6,412,219 for reasons stated on pages 2-3 of the Office Action (Paper No. 061004). In support of this rejection, the Examiner only cites Brass '678 for disclosing in general a non-destructive surface inspection method comprising steps of irradiating the surface of an ultraviolet light on a surface of a specimen, and admits that Brass '678 does **not** disclose "capturing the image of the surface through camera" "display the image on a screen" and "using a green (G) signal component of the image acquired by the camera". However, the Examiner cites Chappelle '219, as a secondary reference, for allegedly disclosing these features.

The Examiner's assertions are factually incorrect, however. Features of Applicants' claims 22-26 and 28-32 are **not** disclosed or suggested by Brass '678 or Chappelle '219, whether taken individually or in combination with any other references of record. Therefore, Applicants respectfully traverse the rejection and

request the Examiner to reconsider and withdraw this rejection for reasons discussed herein below.

First of all, neither Brass '678 nor Chappelle '219 discloses any non-destructive inspection method and apparatus in which a penetrant inspection and/or magnetic-particle inspection are used to inspect deficiencies on a surface of a specimen, such as a crack or opening in a surface of the specimen. For example, Brass '678, as a primary reference, only discloses a halogen lamp system, as shown in FIG. 1, having a lamp (bulb and filter) and a control unit used to pulse the lamp "ON" and "OFF" for use in leak detection or non-destructive testing, that is, emitting ultraviolet light of a particular wavelength to detect faults or leaks in machinery and equipment. As a secondary reference, Chappelle '219 only discloses a method and system, as shown in FIG. 2, for providing accurate measurements of live vegetation and crop residue cover, of stress or damage to the vegetative cover, and of the rate of decay of dead organic material covering soil. The system includes a source 30 of ultraviolet radiation 32 which induces fluorescent emission 34 in various materials 22 which exhibit different fluorescent properties, a sensor 39 and a data acquisition system 43 which records the quantity of fluorescent emission 34 from the various materials 22 in order to measure characteristics of the materials 22.

Again, neither Brass '678 nor Chappelle '219 discloses any non-destructive inspection method and apparatus in which a penetrant inspection and/or magnetic-particle inspection are used to inspect deficiencies on a surface of a specimen, such as a crack or opening in a surface of the specimen, utilizing specific steps or means, as expressly defined in Applicants' claims 22-26 and 28-42.

Nevertheless, for purposes of expedition, claims 28-29 and 31-32 have been canceled without prejudice. Base claims 22, 24, 25, 26, 33, 35, 36, 37, 38, 39 and 40 have been amended to further define the specific steps taken for "penetrant-inspection" or "magnetic-particle-inspection" for deficiency inspection, that are not disclosed or suggested from Brass '678 and Chappelle '219. For example, base claims 22, 24, 25, 33, 36 and 37 further define the specific of "magnetic-particle inspection scheme", including, for example:

[image pickup means] picking up an image on a surface of a specimen by using a color camera through a filter which filters the ultraviolet light among light from the surface of said specimen including a fluorescent light emitted from the magnetic particle coated on said specimen and irradiated by the ultraviolet light;

[means] detecting a deficiency candidate on the surface of said specimen by using a green (G) signal component of said image which contains the largest amount of emission information of the fluorescent light, acquired by said color camera."

Again, neither Brass '678 nor Chappelle '219 discloses any "magnetic-particle inspection scheme" for detecting deficiency candidates using a green (G) signal component which includes the most emission information of fluorescence emitted, as expressly defined in Applicants' base claims 22, 24, 25, 33, 36 and 37.

Similarly, base claims 26, 38 and 39 further define the specific of "penetrant inspection scheme" including, for example:

picking up an image of a surface of a specimen by using a color camera;

converting RGB data of the picked-up image to chromaticity and luminance, and computing hue and chrominance in each position on the picked-up image from said chromaticity and luminance; and

detecting a deficiency candidate on said surface by using information of said hue and chrominance computed from said chromaticity and luminance converted from said RGB data of the picked-up image.

Again, neither Brass '678 nor Chappelle '219 discloses any penetrant-inspection scheme for detecting deficiency candidates using information of said hue and chrominance computed from said chromaticity and luminance converted from said RGB data of the picked-up image, as expressly defined in Applicants' base claims 26, 38 and 39.

Lastly, base claims 35 and 40 define both the "magnetic-particle inspection scheme" for detecting deficiency candidates using a green (G) signal component which includes the most emission information of fluorescence emitted, and the "penetrant-inspection scheme" for detecting deficiency candidates using information of said hue and chrominance computed from said chromaticity and luminance converted from said RGB data of the picked-up image, features that are **not** disclosed or suggested by Brass '678 nor Chappelle '219.

In order to establish a *prima facie* case of obviousness under 35 U.S.C. §103, the Examiner must show that the prior art reference (or references when combined) must teach or suggest all the claim limitations, and that there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skilled in the art, to modify the reference or to combine reference teachings, provided with a reasonable expectation of success, in order to arrive at the Applicants' claimed invention. The requisite motivation must stem from some teaching or suggestion to make the claimed combination must be found in the prior art, and **not** based on Applicants' disclosure. In re Vaeck, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). See MPEP 2143. Moreover, any deficiencies in the cited references cannot be remedied with conclusions about what

is "basic knowledge" or "common knowledge". See In re Lee, 61 USPQ 2d 1430 (Fed. Cir. 2002).

In the present situation, both Brass '678 and Chappelle '219 utterly fail to disclose and suggest virtually all features of Applicants' claims 22-26 and 28-42. Therefore, Applicants respectfully request that the rejection of claims 22-26 and 28-42 be withdrawn.

Claim 27 has been rejected under 35 U.S.C. §103(a) as being unpatentable over Chappelle et al., U.S. Patent No. 6,412,219, as modified to incorporate selected features from Silva, U.S. Patent No. 4,978,862 for reasons stated on pages 3-3 of the Office Action (Paper No. 061004). Again, Silva '862, as a secondary reference, is only cited for disclosing the use of a "polarizing filter". However, Applicants' base claim 27, as amended, defines a "penetrant-inspection scheme", comprising:

- illuminating a surface of a specimen with polarized light;
- picking up an image of said surface illuminated with said polarized light by a color camera via a polarization filter, wherein said color camera is calibrated by using a camera calibration color chart for inspection;
- extracting deficiency candidates from said image acquired by said color camera; and
- displaying images of said extracted deficiency candidates on a screen,

wherein in the step of extracting deficiency candidates, said image is calibrated using a calibration parameter inherent to said color camera determined from image data of said camera calibration color chart picked up by said color camera.

Again, neither Chappelle '219 nor Silva '862 discloses any penetrant-inspection scheme for detecting deficiency candidates by using the image which is calibrated using a calibration parameter inherent to the color camera, as expressly defined in Applicants' base claim 27.

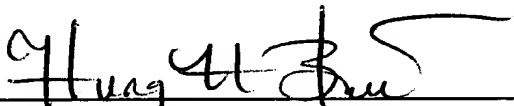
In view of the fact that neither Chappelle '219 nor Silva '862 discloses or suggests all key features of Applicants' claim 27, Applicants respectfully request that the rejection of claim 27 be withdrawn.

In view of the foregoing amendments, arguments and remarks, all claims are deemed to be allowable and this application is believed to be in condition to be passed to issue. Should any questions remain unresolved, the Examiner is requested to telephone Applicants' attorney at the Washington DC area office at (703) 312-6600.

To the extent necessary, Applicants petition for an extension of time under 37 CFR §1.136. Please charge any shortage of fees due in connection with the filing of this paper, including extension of time fees, to the Deposit Account of Antonelli, Terry, Stout & Kraus, No. 01-2135 (Application No. 520.40381X00), and please credit any excess fees to said deposit account.

Respectfully submitted,

ANTONELLI, TERRY, STOUT & KRAUS, LLP

By   
Hung H. Bui (Reg. No. 40,415)  
Attorney for Applicant(s)

HHB:btd

1300 North Seventeenth Street, Suite 1800  
Arlington, Virginia 22209  
Tel.: (703) 312-6600  
Fax: (703) 312-6666